



Erasmus+



## **BLENDED INTENSIVE PROGRAMME (BIP) 2024 Master Degree in Psychology + Doctoral students**

**Title: Fostering critical thinking in psychological science**

**Host institution:** University G. d' Annunzio of Chieti-Pescara (Italy) - UdA, Department of Neuroscience, Imaging and clinical sciences (DNISC)

**Partners' institutions:** Stockholm University (Sweden) - SU, University of Granada (Spain)- UGR

**Structure:** two sessions (online – in presence in Chieti)

**Number of ECTS provided: 3**

**Starting date:** April 29

Blended Intensive Programs (BIPs) are intensive transnational study programs of short duration, characterized by activity to be carried out in presence (minimum 5 days) and activity to be carried out online. A BIP is therefore an educational initiative including a virtual component and an in-presence component that can be assimilated to a Summer/Winter School. The initiative must include at least 3 partners Institutions.

The idea of the proposed BIP 2023-24 is to stimulate a critical discussion about the issues of reproducibility and open science in cognitive psychology/neuroscience research. In particular, students from the three countries will be involved in the acquisition and analysis of experimental data of the same cognitive paradigm and will reflect on potential sources of variability/instability influencing the results. The main topic will concern the potential role of cross-cultural influences on data reproducibility, which will be addressed by comparing results across laboratories. However, the program will also aim at fostering critical thinking on all the possible sources of inter-subject/inter-group variability (context, instrumentation, etc.) as well as on open science debate (e.g., providing information about available databases).

# PROGRAMME

## FIRST SESSION (ONLINE)

### **Opening day: April 29**

h 1PM-4PM

- INTRODUCTION: General information about the BIP (Carlo Sestieri & Giorgia Committeri, UdA, [carlo.sestieri@unich.it](mailto:carlo.sestieri@unich.it) [giorgia.committeri@unich.it](mailto:giorgia.committeri@unich.it))
- Group self-presentation (Partners, staff and students)

h2.30PM

- SEMINAR: "Reproducibility and open science" ([Stefan Wiens](mailto:Stefan.Wiens@psychology.su.se), Department of Psychology SU, [sws@psychology.su.se](mailto:sws@psychology.su.se))

#### Abstract:

The goal of science is to accumulate knowledge in an unbiased manner. Science involves many steps such identifying a problem of interest, forming a research question, designing a study or experiment, collecting data, analyzing the data, interpreting the results, and communicating the results. All of these steps are threatened by various biases. Open science tries to make these threats explicit and protect science from them. If science is not open, results are likely to be irreproducible; this hampers any gain in knowledge. I will give an overview combined with active discussions and exercises to sensitize students of the importance of practicing open science.

### **Second day: April 30**

h 3PM-6PM

3PM

- SEMINAR: " The Effort Paradox: Why Cognitive and Physical Work is Loathed and Loved (Parts I)" ([Michael Inzlicht](mailto:michael.inzlicht@utoronto.ca), University of Toronto, [michael.inzlicht@utoronto.ca](mailto:michael.inzlicht@utoronto.ca))

#### Abstract of Part I and II:

People and other animals dislike effort. This dislike is so robust in fact that in a discipline with few laws, psychology has proposed the law of least effort: when given equally rewarding options, organisms will choose option requiring the least amount of physical and cognitive work. Despite the robustness with which people avoid effort, there is also evidence that people find effort valuable and meaningful. In this series of talks, I will discuss the two sides of effort. In the first lecture, I will focus on effort's costs, examining the physiological antecedents and consequences of effort exertion, and the implications of these effort costs for interpersonal processes, such as empathy and prosociality. In the second lecture, I will focus on effort's value, whereby people and other animals value effort retrospectively, putting a premium on goods that were acquired via high effort, but also prospectively, for example, via the process of learned industriousness when effort choices are reinforced. Prominent models in psychology, neuroscience, and economics agree that effort is costly and avoided. Here, I highlight that this is only partly true, and that the law of least effort needs amending.

4PM

- SEMINAR: "Study design and preregistration" ([Rafael Roman Caballero](mailto:Rafael.RomanCaballero@ugr.es), Department of Experimental Psychology, and Mind, Brain & Behavior Research Center, UGR; Department of Psychology, Neuroscience, and Behaviour, and McMaster Institute for Music and the Mind, McMaster University, Hamilton, Canada, [rrarroca@ugr.es](mailto:rrarroca@ugr.es))

#### Abstract:

When a study shows evidence in favor of the presence of a causal effect or association between two or more variables is typically branded as "positive." Conversely to "negative" studies,

positive results are more likely to be published and academics tend to perceive them as more valuable, which may shape academics' behavior. For example, researchers may, consciously or unconsciously, steer their study towards a positive result such as hypothesizing after the results are known (HARKING) or p-hacking (that is, making preprocessing and analytical decisions to achieve a p value below .05). To prevent these questionable research practices, it has been proposed to make public the hypotheses, study design, and analysis plan before collecting or looking at any data, known as preregistration. An advance of this philosophy was the emergence in 2012 of the studies known as registered report (RR), which involve two peer-review stages: one assessing the theoretical background and the proposed methods and analyses before the beginning of the collection of the data, and another after receive in principle acceptance and conducting the study. In this workshop, we will work on the necessary practical steps to preregister a study and conduct a registered report.

Despite the advantages of preregistration and registered reports for scientific transparency and prevention of questionable practices, it is debated whether they entail certain disadvantages: hindering exploratory research, limiting creativity or serendipity, slowing the pace of research, increasing analytical rigidity, etc. On the other hand, their implementation has spread to such an extent that sufficient information is now available on its consequences: do preregistered studies and RRs more frequently observe null results? Given negative results can receive fewer citations than positive, are preregistered studies and RRs cited less than regular articles? Has preregistration increased the statistical power of studies following this practice? All these issues will be addressed in the workshop to reach practical conclusions for the design of future studies.

Third day: May 2

h 9AM-11AM

9AM

- SEMINAR: "An Integrated Perspective of Effort and Perception of Effort" (Israel Halperin, Department of Health Promotion, School of Public Health, Faculty of Medical & Health Sciences, Tel-Aviv University, Tel-Aviv, Israel, [ihalperin@tauex.tau.ac.il](mailto:ihalperin@tauex.tau.ac.il))

Abstract:

Effort and the perception of effort (PE) have been extensively studied across disciplines, resulting in multiple definitions. These inconsistencies block scientific progress by impeding effective communication between and within fields. Here, we present an integrated perspective of effort and PE that is applicable to both physical and cognitive activities. We define effort as the energy utilized to perform an action. This definition can be applied to biological entities performing various voluntary or involuntary activities, irrespective of whether the effort contributes to goal achievement. Then, we define PE as the instantaneous experience of utilizing energy to perform an action. This definition builds on that of effort without conflating it with other subjective experiences. We explore the nature of effort and PE as constructs and variables and highlight key considerations in their measurement. Our integrated perspective aims to facilitate a deeper understanding of these constructs, refine research methodologies, and promote interdisciplinary collaborations.

10AM

- Instructions on research activities to be conducted at each individual site.

**Second session (in presence-Chieti): June 3-7** (~4 hours each day = ~20 hours)

Day 1: June 3

h 11AM-5PM

- WELCOME GREETINGS
- Light lunch
- 1.30PM
- Presentation of the three "pre-registered" projects

3.30PM

- SEMINAR: “Reproducibility issues and the Italian Reproducibility Network” (Cristina Zogmaister, Università di Milano-Bicocca, Founder and Vice-President of the Italian Reproducibility Network, [cristina.zogmaister@unimib.it](mailto:cristina.zogmaister@unimib.it))

Abstract:

Building upon the themes explored in prior seminars of the BIP, this seminar starts with an overview of the key concepts and terminology central to the realms of open science, transparency, and research reproducibility.

Subsequently, a more nuanced examination of the meaning of “methodological transparency” and “open materials” will be undertaken. We will delve into the significance of transparently documenting methods within scientific reports, elucidate the benefits thereof, and analyse some data on the current landscape of transparency within experimental research in psychology. Furthermore, a detailed analysis of the Transparency of Methods (TOM) checklist will be conducted, highlighting its utility as an evaluative tool for assessing the transparency of scientific reports and as a guide for enhancing one's own scholarly writing practices.

Concluding the presentation, the Italian Reproducibility Network (ITRN) will be presented, a nonprofit association dedicated to the promotion, support, and safeguarding of open science practices. As a member of an international network of Reproducibility Networks, the ITRN endeavours to facilitate the building of an Italian interdisciplinary community of scientists interested in the reproducibility of research, identify factors conducive to research robustness and study replicability, and disseminate such insights throughout the Italian scientific community and beyond.

Day 2: June 4

h 9AM-1PM

- PRESENTATION: "Free resources for statistical data analysis: a guide to JASP" (Claudia Greco, UdA, [claudia.greco@unich.it](mailto:claudia.greco@unich.it))

Abstract

The aim of this work is to explain statistics in an easy way, in order to help students and young researchers become proficient in choosing appropriate analysis methods for their datasets, understanding the processes behind statistical software output, and interpreting analysis results based on the hypotheses. The guide starts by providing an essential statistical glossary, which defines and explains the main concepts such as statistics, statistical models, model assumptions, preprocessing, parameters etc. Then it offers concise explanations of various analysis methods used in cognitive sciences, accompanied by practical examples using the JASP software. Additionally, it includes insights on inferential statistics, particularly in neuroscience. Specifically, the course deals with the analysis of variance (ANOVA), a statistical method used to analyze the differences between group means in a study, examining one-way analysis of variance (ANOVA), between and within subjects, followed by factorial ANOVA (two-way, three-way, mixed-design etc). Subsequently, the course explores the regression, a statistical method used to model the relationship between a dependent variable and one (linear) or more (multiple) independent variables, together with a detailed explanation of the model, variables and coefficients. Finally, there is a description of the analysis of covariance (ANCOVA), a statistical technique that combines elements of both ANOVA and regression which allows for the comparison of group means while statistically modeling the influence of one or more continuous independent variables.

h10AM

- DATA ANALYSIS: Individual site databases (supervision by Ronald Van den Berg & Maria Giulia Tullo SU & UdA)

h11AM *Coffe break*

- DATA ANALYSIS: Individual site databases (supervision by Ronald Van den Berg & Maria Giulia Tullo SU & UdA)

### Day 3: June 5

h 9AM-1PM

- DATA ANALYSIS: Multi-site database (supervision by Ronald Van den Berg & Maria Giulia Tullo SU & UdA)
- h11AM *Coffe break*
- SEMINAR: "Effort and fatigue: cognitive and neurobiological theories" (Marika Berchicci, UdA, [marika.berchicci@unich.it](mailto:marika.berchicci@unich.it))

#### Abstract:

Human fatigue is a multidimensional concept combining neurophysiological and psychological aspects, although the latter have received less attention until recently.

Muscle fatigue has classically been attributed to peripheral factors within the muscle, but, more recently, it become clear that the central nervous system plays an important role in the onset of fatigue during prolonged cognitive or physical exercise. Few models have been proposed to explain the central mechanisms underpinning for the onset of physical fatigue, pointing to the synthesis and metabolism of brain monoamines, brain mechanisms using the symptoms of fatigue as anticipated key regulators to insure homeostasis, potential motivation and perceived exertion, as well as interoceptive afferences. However, there is a growing attention on the role of perceived effort in exercise-induce fatigue.

Mental fatigue is a psychobiological state caused by prolonged periods of demanding cognitive activity and characterized by subjective feelings of tiredness and lack of energy. Mental fatigue is associated with reduced cognitive and behavioral performance.

In the present lecture, we will discuss the taxonomy of fatigue, the main models explaining physical and mental fatigue, and a connection between fatigue and effort, both physical and mental, will be delineated.

#### Suggested readings:

Boksem MAS, Tops M. (2008). Mental fatigue: costs and benefits. *Brain Res Rev.* 59: 125-139; Enoka RM, Duchateau J. (2016). Translating Fatigue to Human Performance. *Med Sci Sports Exerc.* 48(11):2228-2238.

### Day 4: June 6

h 9AM-1PM

- SEMINAR: "Using models to study individual differences in behavior" (Ronald Van den Berg, SU, [ronald.van-den-berg@psychology.su.se](mailto:ronald.van-den-berg@psychology.su.se))
- SEMINAR: "Cross-cultural approaches in social psychology" (Stefano Pagliaro, UdA)

#### Abstract:

Psychology is WEIRD -- that is, the bulk of studies are conducted in Western, Educated, Industrialized, Rich, and Democratic countries. If that wasn't enough, most studies use college students as participants. But, Western college students are not the best representatives of human perception, emotions, behavior. This seminar attempts to show the importance of considering cultural aspects -- in terms of similarities and differences -- in social psychological research. In particular, reference will be made to some aspects considered central in recent decades, such as the moral foundations, political ideology, and cultural syndromes.

h11AM *Coffe break*

- SEMINAR: " The Effort Paradox: Why Cognitive and Physical Work is Loathed and Loved (Parts II)" (Michael Inzlicht, University of Toronto)

h 3PM Afternoon TRIP and farewell DINNER

Day 5: June 7

h 9-13

- Result presentation and reflections  
h11AM *Coffe break*
- Group critical analysis and discussion on Multi-Lab and multi-site results

\* Free (not mandatory) lab visits (fMRI, MEG, EEG, NIRS, TMS, EEG-TMS) as well as cultural tours in Chieti and Pescara will be organized during the afternoons of Day1-3 and 5, also according to the interest of the participants.

**Final requirements/assessment:**

- presence (at least 80% of the lesson hours)
- Group critical analysis and discussion on Multi-Lab and multi-site results